

Evaluate

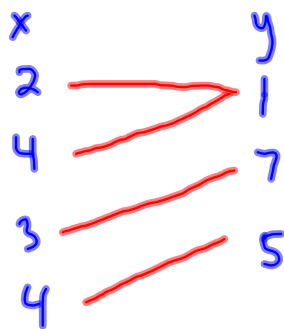
$$\textcircled{1} \frac{4-3}{7-8} = \frac{1}{-1} = -1$$

$$\textcircled{3} \frac{2-7}{5-5} = \frac{-5}{0}$$

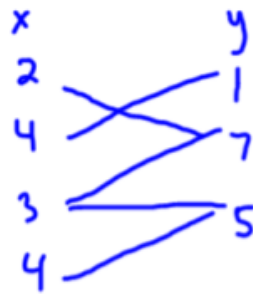
undefined

$$\textcircled{2} \frac{8-8}{3-5} = \frac{0}{-2} = 0$$

Functions

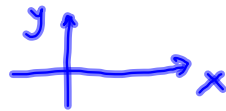


yes ↑ 1 output
per input



Not a function
only have 1 y
for every x

Slope



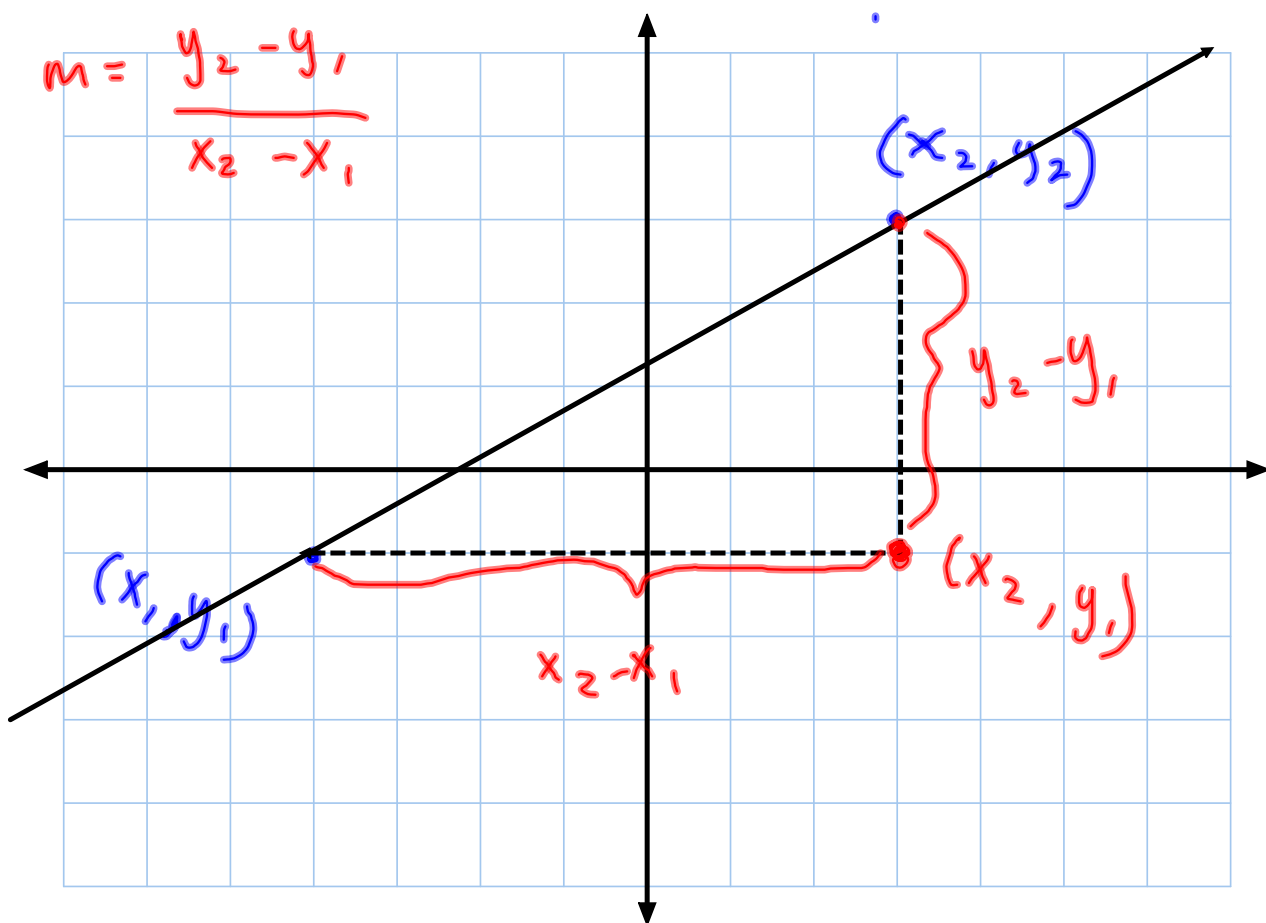
$$y = \underbrace{m}_\text{slope} x + b$$

$$\frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

Δ means delta
means change

~~*~~rate of change

also written
as $\rightarrow \frac{y_1 - y_2}{x_1 - x_2}$

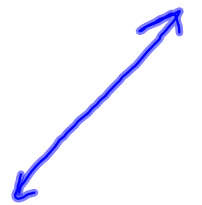




rise of 15 in
run of 54 in
what is the
slope?

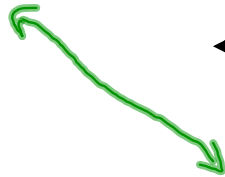
$$m = \frac{\text{rise}}{\text{run}} = \frac{15}{54} = \left(\frac{5}{18} \right)$$

$m > 0$
Positive



up to
the right
or
down to
left

$m < 0$
Negative



down to
right
or
up to
left

$m = 0$
Zero



$$\frac{\text{rise}}{\text{run}} = 0$$

$$\frac{0}{\cancel{x}}$$

$m = \text{undefined}$
Undefined



$$\frac{\text{rise}}{\text{run}} = \text{undefined}$$

$$\frac{\cancel{x}}{0}$$

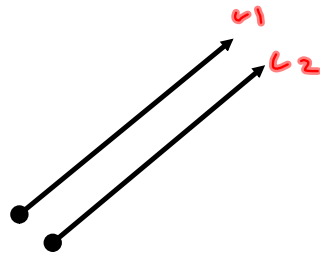
Example | $\overset{x_1}{(-5)}, \overset{y_1}{1}, \overset{x_2}{3}, \overset{y_2}{1}$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 1}{3 - (-5)} = \frac{0}{8} = 0$$



Parallel Lines

have equal slopes



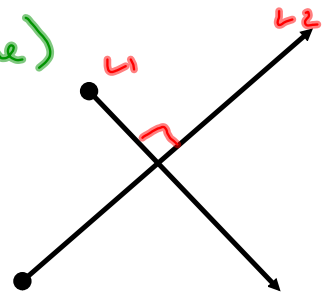
Perpendicular Lines (90° angle)

negative reciprocal

$$m_1 = -\frac{1}{m_2}$$

or

$$m_1 \cdot m_2 = -1 \quad \checkmark$$



Example : $m_1 = -\frac{1}{4}$ $m_2 = 4$

$$m_2 = -\frac{1}{-\frac{1}{4}} = 1 \cdot \left(\frac{4}{1}\right) = 4$$

Example : $m = \frac{3}{1}$ $m_2 = -\frac{1}{\frac{3}{1}}$

$$m_1 \cdot m_2 = -1 \quad \left(\frac{3}{1}\right) \cdot \left(-\frac{1}{3}\right) = -\frac{3}{3} = -1 \quad \checkmark$$

Q 86 #6-9
18-23 } fraction \perp , \parallel , neither
29-34 \leftarrow as a fraction

18)

$$L_1: (3, -1) (6, -4)$$

$$L_2: (-4, 5) (-2, 7)$$

(x, y)

$$m_1 = \frac{-1 - -4}{3 - 6} = \frac{3}{-3}$$

$$= -1 = -\frac{1}{1}$$

$$m_1 \cdot m_2 = -1$$

$$-1 \cdot 1 = -1 \quad \textcircled{\perp}$$

$$m_2 = \frac{5 - 7}{-4 - -2} = \frac{-2}{-2}$$

$$= 1 = \frac{1}{1}$$